CLAIMS

I claim:

1. A method for adjusting the bulk property of a manufactured component, comprising:

obtaining a manufactured component having a bulk material property that is to be adjusted;

directing a high energy beam onto the manufactured component such that the bulk material property of the manufactured component is adjusted.

2. The method of claim 1, wherein:

the manufactured component comprises a resistor; and

the bulk material property is a resistance of the resistor.

3. The method of claim 2, wherein the resistor is formed from a matrix component and an embedded conductive component.

4. The method of claim 3, wherein the matrix component comprises a cross-linkable polymer.

5. The method of claim 3, wherein the matrix component comprises a methacrylate polymer combined in a matrix form with cetyltrimethyl ammonium bromide.

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6. The method of claim 3, wherein the matrix component comprises a vinyl polymer combined in a matrix form with cetyltrimethyl ammonium bromide.

7. The method of claim 3, wherein the embedded conductive component comprises conductive particles embedded in the matrix component.

8. The method of claim 7, wherein the conductive particles comprise carbon particles.

9. The method of claim 8, wherein, in response to the high energy beam, the matrix component shrinks, thereby reducing an average spacing between the carbon particles in the matrix component and reducing the resistance of the resistor.

10. The method of claim 3, wherein, in response to the high energy beam, the resistance of the resistor is reduced substantially without ablation of the matrix component.

11. The method of claim 11, wherein the manufactured component comprises a first layer that includes the matrix component and the embedded conductive component and a second layer that is formed over the first layer, such that the high energy beam is directed through the second layer onto the first layer.

12. The method of claim 3, wherein the matrix component comprises a sol-gel material.

13. The method of claim 11, wherein the conductive component comprises a conductive suboxide material.

14. The method of claim 12, wherein the conductive suboxide material comprises one of silicon suboxide and titanium suboxide.

15. The method of claim 12, wherein, in response to the high energy beam, oxygen included in the sol-gel material combines with the conductive suboxide material, thereby increasing the resistance of the resistor.

16. The method of claim 3, wherein directing the high energy beam comprises differentially directing the high energy beam onto different portions of the manufactured component so as to obtain a gradient of the resistance over a dimension of the manufactured component.

17. The method of claim 16, wherein the gradient of the resistance operates to reduce abrupt resistive transitions in the resistor compared to the abrupt resistive transitions that would have existed in the absence of the gradient of the resistance.

18. The method of claim 17, wherein reduction of the abrupt resistive transitions reduces signal reflection during operation of the resistor.

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19. The method of claim 17, wherein reduction of the abrupt resistive transitions reduces electromagnetic interference associated with operation of the resistor.

20. The method of claim 3, further comprising connecting the resistor to a printed circuit board prior to directing the high energy beam onto the manufactured component.

21. The method of claim 1, wherein:

the manufactured component comprises a capacitor; and

the bulk material property comprises a dielectric constant.

22. The method of claim 1, wherein:

the manufactured component comprises one of a resonator and an oscillator; and

the bulk material property comprises Young's modulus.

23. The method of claim 1, wherein:

the manufactured component comprises an optical component; and

the bulk material property comprises one of:

a bulk refractive index of a material used to form the optical component;

a crystalline structure of a material used to form the optical component;

a matrix size of a material used to form the optical component; and

an opacity of a material used to form the optical component.

24. A method for manufacturing a resistor, comprising:

obtaining a resistor having a resistance and being formed from a matrix component and an embedded conductive component;

testing the resistor and determining that the resistance of the resistor falls outside of a nominal value range associated with the resistor;

in response to determining that the resistance falls outside of the nominal value, adjusting the resistance of the resistor by:

directing a high energy beam onto the resistor, such that the resistance of the resistor is adjusted within the nominal value range, the high energy beam being directed onto the resistor in a manner such that substantially none of the matrix component ablates.

25. The method of claim 24, wherein, in response to the high energy beam, the matrix component shrinks, thereby reducing the resistance of the resistor.

26. The method of claim 24, wherein, in response to the high energy beam, oxygen included in the matrix component reacts with the conductive component so as to increase the resistance of the resistor.

27. A method for manufacturing a resistor, comprising:

obtaining a resistor having a resistance and being formed from a matrix component and an embedded conductive component; and

differentially directing a high energy beam onto different portions of the resistor, such that a gradient of the resistivity of the resistor across a dimension of the resistor is achieved, the high energy beam being directed onto the resistor in a manner such that substantially none of the matrix component ablates.

28. The method of claim 27, wherein:

the matrix component comprises a cross-linkable polymer; and

the conductive component comprises carbon particles.

29. The method of claim 27, wherein:

the matrix component comprises a sol-gel material; and

the conductive component comprises one of silicon suboxide and titanium suboxide.